



**MAY THE
FORCE
BE WITH
YOU**



Contrary to bi-metric gravitational theories, the "negative mass" in Platonic theory of spacetime is not physical but Platonic entity placed in the **potential** future of the global arrow of Time, thanks to which the *positive mass* is endowed with **self-action**: it acts **upon** itself, **by** itself. This is the fifth force. There is no "dark energy".

Ladies and Gentlemen,

It is my great pleasure to announce a major breakthrough in **Physics**: a new force of Nature (pp. 7-8 in *The Fifth Force*). Given the previous **four forces**, it will be the **fifth force** (*ibid.*, p. 2). It makes all forces **self-acting** (p. 2).

It (not "He") has a very wide triple presentation. The fifth force is the force of Time as 'energy from geometry' (Slide 1 and Slide 2), thanks to which we face the **asymmetry** of past and future. Secondly, it delivers the **energy of gravity**, still unexplained in **General Relativity**. And thirdly, the fifth force is the force of Life (**Erwin Schrödinger**), as it empowers **all living organisms**. I will elaborate on the latter point shortly, by explaining the **new physics** of the **human brain**. First, let me set the record straight.

My full name is Dimitar G. Chakalov (pronounced *tcha-KA-lov*; notice the accent on the *second* syllable). I am the founder of **spacetime engineering**. It is a new field of natural science, nested at the interface of life science, psychology, and physics. Read about spacetime engineering and the **fifth force** at my website chakalov.net, and notice at the end **the purpose** of my project. If you're short of time, read closely the first paragraph at the top.

Now, I will briefly explain the crux of the fifth force as the force of Life. See **photo 2** and recall the **binding phenomenon** (no **privileged** brain area). The brain uses energy at every local area, following the rule 'think globally act locally'. The "thinking" has unique physical origin: the **matrix** (p. 7 in *The Fifth Force*). The mind does not act *directly* on its brain.

Physiology of *activity* (N. Bernshtein, p. 13 in [Intro.pdf](#)): compare it with the energy and momentum of a billiard ball kicked with a stick. The ball is *not* animated, meaning it is not 'active'. In [Force.jpg](#), the energy of the animated ball (**gimbal**) springs from the "**negative mass**": watch [ball.mp4](#) and notice the **evolution equation** on p. 28 (last) in *The Physics of Life*.

Key point: new **self-action**. Not like **Baron Munchausen**. Illustration with a **kitchen glove**: the **fifth force** makes all **four forces self-acting**. No "mental energy", no "dark energy", no "**gravitational energy**", and no **physical force** of the **arrow of Time** either. We only have **self-acting** 'gloves' empowered by the **fifth force**, like the **Platonic** 'hand' *inside* the **physical 4D 'glove'**.

Read Addendum 1 (excerpt **below**) in *Spacetime Engineering 201*, pp. 7-9. **Time** is a complex phenomenon with *necessary* and *sufficient* components, which cannot be separated. The billiard ball (watch again [ball.mp4](#)) is set in motion by **both** the necessary physical component (the stick) **and** the **sufficient** component from the global **Heraclitean Time**: the **fifth force**. It (not "He") springs only from the **energy of geometry** (Slide 1 and Slide 2).

Thus, the ball is literally **acting on itself**, like the **physical glove** below.

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Addendum 1

If you think of the fifth force (p. 6) as some *physical* field, you will have to call this new physical field “**dark matter**” and “**dark energy**” (Addendum 5), and speculate extensively about “**black holes**”. Don’t.



The **monad** itself has no *windows* through which something can enter or leave (Leibniz, *Monadology* 7). The **Platonic** hand has no *windows* either. We see only its 4D glove, and can deduce the existence of **Platonic** hand only from the **self-acting** faculties of its glove.

Although the **fifth force** is executed only *by* the glove, it cannot be derived exclusively *from* the glove; for example, one cannot derive the *asymmetry* of Time (p. 1) from matter and fields constituting the 4D ‘glove’.

Let’s see how we can propel the **ball**/glove like a **gimbal**. This is not some **propellantless propulsion** with “**dark energy**”, but the **fifth force** in action.



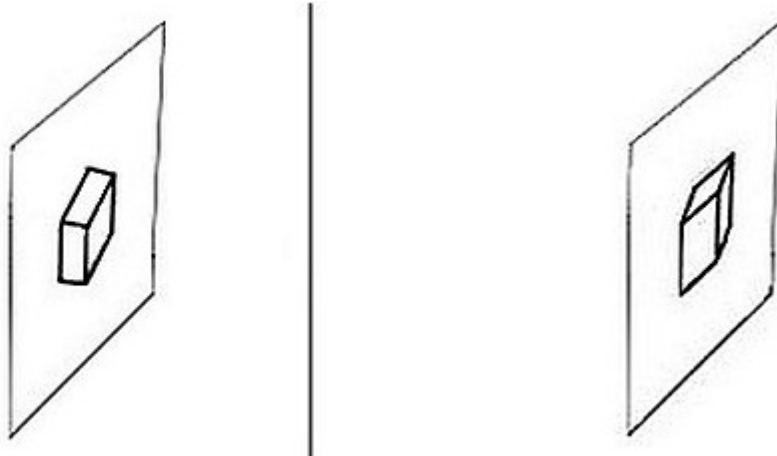
We need **quantum gravity** to unite the **physicalized energy from gravity** with the **physicalized energy from the quantum vacuum**. And we must get the job done **before 2030**, to prevent the upcoming **climate catastrophe**.

vimeo

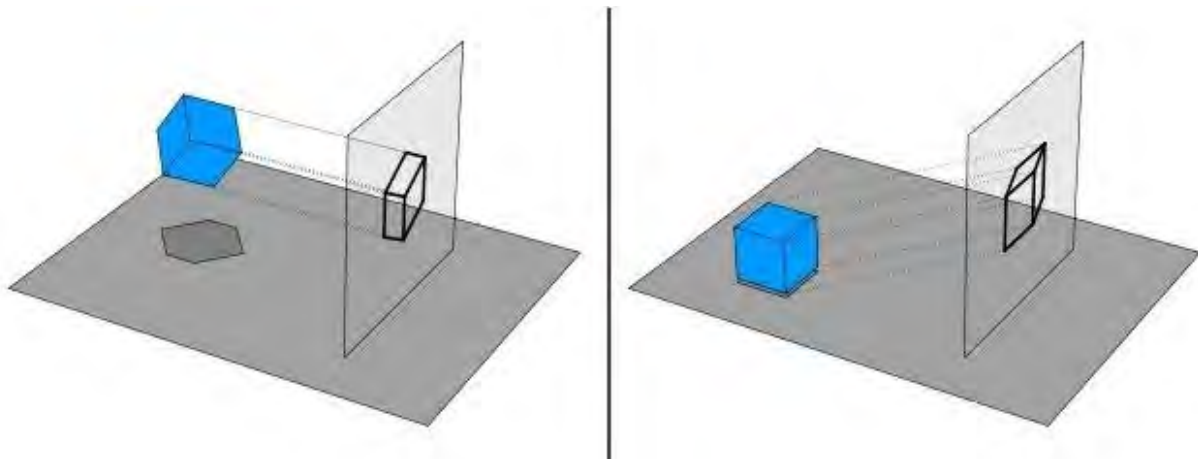
The Fifth Force: Proof of Concept

Impossible? Like “stones cannot fall from the sky” (p. 4 in *The Fifth Force*)? Let me try to explain your confusion with an analogy from **Wikipedia** below.

The [human brain](#) and its mind (or if you prefer, the human mind and its [brain](#)) are *completely* and *totally* different things. They are “connected”, but how? As an illustration of the puzzle, see the two 2D drawings below, which are made of the same stuff and are only slightly different.



The two 2D drawings above have a common origin: the blue 3D cube below.



If the blue 3D cube rotates, its two (complementary) 2D projections will change accordingly. Thus, the “connection” is made by, and passes through their common 3D source. Simple and clear. Our case is much more difficult to explain, firstly because the common source of matter and psyche is *not* physical stuff: it does not live anywhere on the [light cone](#). With light, we do *not* have access to our “blue cube”. With light, we see only its physical, 4D “projection” — the [human brain](#) — and can “see” our subjective world only with introspection (*ibid.*, pp. 2-3). As [Thomas H. Huxley](#) remarked: “How it is that anything so remarkable as a state of consciousness comes about as a result of irritating nervous tissue, is just as unaccountable as the appearance of the Djinn, when Aladdin rubbed his lamp.”

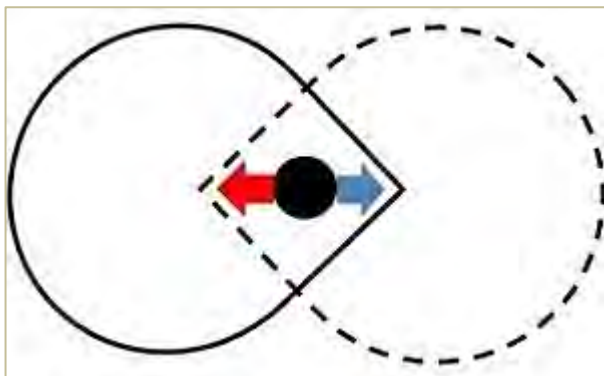
In the doctrine of *trialism*, the “blue cube” is **Platonic** “trunk”. Clear, but *not simple*. Read [Notes on Spacetime Engineering](#) and [The Physics of Life](#).

Now, in order to propel the **ball** (p. 2) like a **gimbal**, first you have to follow the Law of Reversed Effort: “To the mind that is still, the whole universe surrenders” (Lao Tzu). This is how you can access the *sufficient* condition (p. 1) viz. the **fifth force**. It will *unfold* toward you (Q1). No, you can’t do it with “**meditation**”. The task is to obtain particular *qualia* from the **future states** of the **ball**: the **matrix** (p. 7 in *The Fifth Force*). Then the ball will be “animated” and included in your **body schema**.



You only have to swing the **carrot** toward your preferred destination, and the donkey – not you – will carry you and the cart there. The **self-energy** of the “animated” cart/**ball** (p. 2)/**gimbal** comes from the fifth force (p. 2). The **self-energy** of, and the **self-action** by the fifth force (p. 1) are *not* like **Baron Munchausen**. Newton’s 3rd law is *not* valid here. Read closely *RS Spacetime*.

Nature employs spacetime engineering, we only have to follow its rules. The **inertial reaction forces** (John A. Wheeler) are **instantaneous**: read p. 13 and p. 19 in James F. Woodward and Thomas Mahood. Thanks to the **fifth force**, we see – with light – only the **net effect** called *positive* mass.



If you are in a car at rest placed on a scale, the latter will measure the net effect of two opposite and *conceptually distinct* (Wikipedia) components. But if the car is on a road and is accelerating, **people claim** that the same net effect will emerge **instantaneously** as ‘**inertia**’ (you will be pushed back by the **red** arrow). Why apply “brakes” to mass?

Because *accelerating* bodies encounter the resistance of *attractive* gravity: read NB on p. 5 in *RS Spacetime*. Now add a “**push**” from *repulsive* gravity.

Acknowledgments

I am indebted to **Ni Guangjiong** for pointing out the *source* of gravity (p. 6), carried by **non-linear** gravitational radiation: the **gravitational dipole**. I am also very grateful to **Banesh Hoffmann** for his 1964 essay on negative mass: “If the universe is such that **negative-mass particles** can, on balance, “escape to infinity” there will be an effect of continual creation of positive energy in the observed region” (pp. 95-96). Needless to say, I am solely responsible for all possible omissions and errors in my talk on **23 June 2022**.

D. Chakalov
23 June 2022, 08:28 GMT



Q1: Can I learn spacetime engineering?

A1. In the doctrine of *trialism*, the Universe *and* God as Love (1 John 4:8) are indistinguishable – **not** identical. Read p. 6 in *The Fifth Force* and C2 on p. 13 in *Quantum of Spacetime*. First, you will have to learn the nuts and bolts of the theory, which is the *necessary* condition. Otherwise you will be only ‘kicking spoons on the floor’: read p. 8 in *Notes on Spacetime Engineering*. But to access the *fifth force* – the crucial *sufficient* condition explained on p. 1 – ask God (Matthew 7:7) to give you the strength to help people in need. Thus, all spacetime engineers will practice natural healing as well, always free of charge. If you do not feel the *need* to help people, like a family doctor or a nurse, you will never get help from God viz. from the Universe by the *fifth force* and will be helpless, like a *lonely fish*. You will be able only to play with *parapsychology* and *entertain people*. If all these “magicians” worked under *strictly controlled conditions*, there will be no “magic” and no “mystery”. Can’t get *seriously rich* from science.

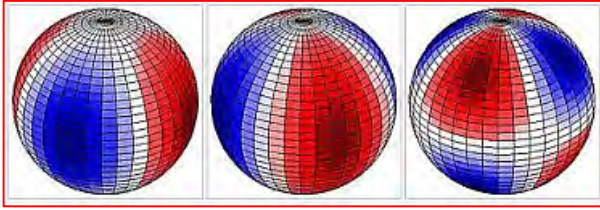
Again, the *necessary* condition is very simple: all you need is at my [website](#). But the *sufficient* condition (p. 1) is a matter of your free will choice.

Q2. I cannot understand your ideas about the inertial reaction forces (p. 4).

A2. My ideas are related to the theory of Dennis Sciama (20 August 1952): “*the motion of the universe*” refers to the *non-relational* Time (Sic!) in *RS Spacetime*. We also suggest a new *quasi-local* dynamics of gravity – think globally act locally. The “thinking” is performed by the **Platonic** quantum-gravitational world, which is being “already” **re-nullified** at every instant ‘here and now’: read p. 6 in *RS Spacetime*. The “quantization” due to the *lattice of 4D spacetime* is *not* observable ‘online’ with light. Secondly, to grasp the two opposite and *conceptually distinct* components (p. 4), think of a bucket you can fill with a hot and cold water: the bucket always has “positive” water (*positive mass*), but can have different temperature, like the three cases of *balanced* mass-energy-momentum explained on p. 12:

4 apples: $T^{ab}{}_{;b} = 0$	5 apples: $T^{ab}{}_{;b} = 0$	2 apples: $T^{ab}{}_{;b} = 0$
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Those who reject my [theory of gravity](#) as “too speculative” will be kindly invited to explain the [Earth tides](#) with GR (MTW p. 467). The [non-tensorial](#) Christoffel symbols cannot rotate the Earth *and* pull up↑ rocks.



If GWs transported energy, they will be *physical waves*; if GWs *cannot* transport energy, they will be some parapsychological ghosts. This is the dilemma in [GW parapsychology](#).

You need quantum gravity to understand the [coupling of matter to gravity](#). Then you can (hopefully) resolve the puzzle with the object below. Many people imagine a “black hole” lurking underneath, which is yet another case of the old Tanzanian saying: How do we know that Father Christmas has a beard? We know it, because snow falls when he shakes his beard.



The [Event Horizon Telescope](#) project, a collaboration of more than 300 academic scientists from 13 institutions, announced recently “the first direct image of the gentle giant in the center of our galaxy.” It is called [Sagittarius A*](#). Reinhard Genzel and Andrea Ghez were awarded the [2020 Nobel Prize in Physics](#) for ... *what?* For those “[black holes](#)”?

We do not live in some “[vacuum](#)”. Besides, the [time-like naked singularity](#) is inevitable in [GR textbooks](#), only it [never happened](#). The fuzzy photo is from a supermassive body at the center of the Milky Way ([Angelo Loinger](#)).

Again, if you disagree, try first to explain the mundane case of Earth tides [above](#). Keep in mind that Einstein’s GR does not and *cannot* explain the origin of ‘energy from geometry’ (watch [Dianna Cower](#)), because his GR cannot *in principle* incorporate the intrinsically *non-linear* gravitational radiation. Unlike the linear EM radiation, which does *not* carry its source (e.g., electrically charged particles [undergoing acceleration](#)), the genuine *non-linear* gravitational radiation *always* transports its source. But there is no way to modify [Einstein field equations](#) to ‘act on themselves’ and “fly”.

NB: There is no proprietary gravitational energy (p. 6): the [fifth force](#) makes matter and fields *gravitalized* and delivers the effects of gravity. We need [Mathematics](#) to unravel the new hyperimaginary numbers (p. 6 in [RS Spacetime](#)) and try to solve the staggering problems of [number theory](#), [point-set topology](#), and [set theory](#). If you have professional knowledge and experience in [topology](#) and [differential geometry](#), feel free to contact me.

Q3. Where did all the matter of the universe come from?

A3. From the monad *without* windows (p. 4 in [The General Rule 1 + 0 = 1](#)). Let me quote [Krister Sundelin](#): "An analogy would be if you imagine that you are broke. You have \$0 on your bank account. Then you take a loan of \$100,000. You have \$100,000 on your bank account, but you also have a \$100,000 debt, so your net fortune is zero. If you then buy a house for \$100,000, you have \$0, a house, and a \$100,000 debt. Your net fortune is still zero, but now you can live in it."

Stated differently, your energy ("money") is *always re-nullified*: check out the explanation [here](#) and the equation on p. 28 (last) in [The Physics of Life](#), pp. 25-26 in [Can Geometry Produce Work](#), and the essay on gravity [here](#).

Yes, we can "borrow" [unlimited clean energy](#) from the [quantum vacuum](#). Notice that "quantum field theory only cares about energy *differences*. (...) In terms of energy density, this is about 10^{-9} joules per cubic meter. (...) Using $E = mc^2$ to convert between energy and mass, it corresponds to a mass density of about 10^{96} kilograms per cubic meter!" ([John Baez](#)). How can we [square the circle](#)? Read the preceding paragraph [above](#).

Fortunately, you did not ask the question 'when did all the matter of the universe come from', because this question is based on a wrong, albeit *inevitable*, premise leading to the so-called **metric paradox**. Once we introduce the metric of spacetime, after [Hermann Minkowski](#) did on 21 September 1908, we face the *temporal* origin of spacetime which should have existed "before" the instant of creating spacetime endowed with metric. This **metric paradox** prompted [Yakov Zeldovich](#) to suggest that "long time ago, there was a brief period of time during which there was still no time at all." He was, of course, joking. Details in [RS Spacetime](#) and p. 3 in [The Arrow of Spacetime](#). In short, see [Slide 1](#), [Slide 2](#), and [Slide 3](#).

The mathematical solution of the **metric paradox** is yet to be discovered. The conceptual solution ([Slide 3](#)) is grounded on the [Unmoved Mover](#). It (*not* "He") is the engine of the **fifth force**: the *sufficient* component of Time ([p. 1](#)). Physicists like [G.F.R. Ellis](#) acknowledge only the *necessary* component of Time, and are terribly [bewildered](#) by "[mystery matter](#)".

Perhaps you only need [Mathematics](#) to understand the [origin of gravity](#) and the **Platonic** form of reality — "just in the middle between possibility and reality" ([Werner Heisenberg](#)). Because you do need [spacetime engineering](#): read p. 19 in [Notes on Spacetime Engineering](#). I am already old and perhaps will not witness the irreversible [climate change](#), but our children and their children [certainly will](#). Time is [running out](#)!

Q4. How come you aren't rich? Can you hit the jackpot?

A4. Nope. The **future** is **UN**decidable, in the sense that every event 'here and now' is fundamentally underdetermined from its history, after the **Free Will Theorem**. We cannot know the **future** and 'the *unknown* unknown'. Nobody can hit the jackpot. Perhaps the "jackpot" itself might eventually select your numbers that you had chosen to play the lottery, as a fact in your history. But we do not live in some pre-determined world in which every rain drop must fall *exactly* where and when **Allāh** "commands" it to. Thank God, the **future** is *flexible* and open to **synchronicity**. All is possible.